

**ANNUAL SEA TURTLE MONITORING REPORT  
MAINTENANCE DREDGING**

**GALVESTON DISTRICT  
FISCAL YEAR 2000**

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## INTRODUCTION

This report is submitted in fulfillment of requirements of the Endangered Species Act and the Section 7 Consultation - Biological Opinion, dated September 22, 1995, concerning channel maintenance dredging using a hopper dredge. Specifically this report, summarizing hopper dredging operations in Fiscal Year (FY) 2000 within the Galveston District, is submitted in compliance with reasonable and prudent measure No. 8 - Reporting.

The following three hopper maintenance dredging projects were completed in FY 2000.

Freeport Harbor	September 30, 1999 – January 10, 2000
Sabine - Neches Waterway	January 11, 2000 – May 2, 2000
Freeport Harbor	July 30, 2000 – August 28, 2000

The use of hopper dredges to maintain these navigation projects is necessary because of three factors: safety, weather conditions and productivity. These factors are closely interrelated; however, the underlying emphasis is placed on safety. The nearshore Gulf of Mexico is characterized by a wide shallow shelf. The Sabine-Neches Waterway, for example, extends about 22 miles into the Gulf. A cutterhead dredge operating offshore would require a pipeline length that could extend for several miles.

The dredges operating in these channels must be highly mobile to rapidly maneuver out of the way of other vessels. Pipeline cutterhead dredges are not self-propelled, and are held into position with spuds. Furthermore, the swing of the cutterhead is controlled by cables attached to the cutterhead arm. These cables are anchored along the outer limits of the channel to be dredged. Prior to moving the dredge, tenders must raise the anchors, and a towboat must be fastened to the dredge. These characteristics prevent the pipeline dredge from quickly moving out of the channel when other vessels approach. From a practical standpoint, dredges are generally not relocated for normal ship traffic, rather, dredging may be interrupted, but the dredge remains a stationary obstruction in half of the channel. This situation is encountered in inland bays. The use of hopper dredges in the Gulf avoids such a stationary obstruction.

Weather conditions also affect the safety of the dredge and crew. Pipeline dredges were not designed to operate in open-sea conditions. Due to the reasons stated above, these dredges cannot rapidly demobilize in harsh weather. The pipelines used to transport the dredged material to the placement sites would also be highly susceptible to breaking during rough weather. Even in relatively sheltered bays, cutterhead dredges often stop dredging in rough weather, and during frontal passages, only water is pumped to keep tension on the pipelines to prevent breaking. In the open Gulf of Mexico, this precaution would not be effective, even if it were possible to leave the dredge offshore. During relatively calm weather conditions, only the largest cutterhead dredges would be able to operate efficiently. Sea swells make it difficult to control the depth of

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the cutterhead; consequently, this affects the dredging operation. To illustrate this point, in 1977, a 27-inch diameter pipeline cutterhead dredge sank near the jetties while dredging the Entrance Channel of the Port Mansfield project. A frontal passage caused large waves, which battered the dredge, breaking the spud used to secure the vessel. Water entered the dredge through cable ports faster than it could be pumped out. A 27-inch dredge is one of the largest dredges commonly used within the Galveston District.

Productivity of the dredging operation is important because the purpose of dredging is to remove shoals and provide a safe depth for waterborne traffic. The use of pipeline dredges in the open Gulf would result in frequent relocations, or other interruptions, due to weather and traffic conditions. Consequently, it would take longer to remove shoals, which present a hazard to safe navigation. The longer the time to remove the shoals, the longer a dredge must be on site to maintain the channel. The presence of the dredge and pipeline, themselves, present an obstruction to safe navigation. For these reasons, hopper dredges are used exclusively to maintain deep-draft entrance channels in the Galveston District.

The Galveston District will attempt to schedule hopper-dredging operations during the December 1 through March 31 window, wherever feasible. However, it is impossible to schedule all hopper-dredging projects during this time frame, due to the availability of the hopper dredge fleet. Hopper dredging priorities are developed in concert with other Corps Districts that conduct these operations along the Atlantic and Gulf Coasts. The priorities are determined after considering the dredging needs and resident sea turtle populations within the various Districts.

### TURTLE MONITORING PROGRAM

A result of the consultation process was the requirement to document turtle takes by the dredges. In order to accomplish this task, before hopper dredging operations commenced, they were equipped such that all inflows and overflows would be screened. The configuration and location of the screens depends upon the construction of the dredge. The mesh size of this screening is 4-inches by 4-inches. Additionally, around-the-clock monitoring by NMFS-approved turtle inspectors was conducted to identify any turtles or turtle parts that were caught on these screens. Draghead deflectors were also deployed to deflect any turtles that may happen to be in, or near, the path of the draghead during excavation. The design of the deflectors is such that a sediment riffle is created ahead of the draghead, cushioning any contact with turtles thereby preventing injuries.

The observers inspected and cleaned all inflow and overflow screening at the end of each load. Dragheads and deflectors were also inspected immediately after each load, and dredge personnel were informed if repairs were necessary. Data sheets were completed daily, detailing all biological samples and debris found in the screening and dragheads. The observers also recorded the start, end and discharge times for each load, the specific location of the dredging area, the type of material being dredged, weather, tide and water temperature data, the condition of the screening, and any other pertinent information. Any sea turtle encounters or takes were described on a separate incident report form. Additionally, all incidents were photographed and diagrams

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were made of the specimen sampled. Dead specimens were frozen until all concerned parties were notified. Specimens were then weighted with scrap iron and disposed of at the dredged material placement site, thereby ensuring that these same samples would not wash ashore or be taken again by the dredge.

A bridge watch for sea turtles and marine mammals was maintained during all daylight hours, except when the observer was off the bridge, cleaning and inspecting the screens and dragheads. All sightings of cetaceans and sea turtles were recorded in a bridge watch logbook.

### SCREEN CONFIGURATIONS

Turtle monitoring activities were conducted aboard three different hopper dredges during FY 2000. These are the *Stuyvesant*, *Mermentau*, and *B.E. Lindholm* (formerly the *Ouachita*). Each of these vessels was required to have 100% inflow screening with openings no greater than 4" x 4", and rigid draghead deflectors.

### PROJECTS

#### **Freeport Harbor - Entrance and Jetty Channels**

On September 30, 1999 contract hopper dredges began work on the Entrance and Jetty Channels of the Freeport Harbor Project. Contract specifications required dredging an estimated 1,000,000 cubic yards (CY) of shoal material. The required depth of dredging was 49 feet below Mean Low Tide (MLT, Corps of Engineers Datum), with 2 feet of allowable overdepth dredging along the Entrance Channel and 47 feet MLT with 2 feet of overdepth along the Jetty Channel.

Dredging began on September 30, 1999, and was completed on January 10, 2000. Two dredges were employed under this contract, they were the *Mermentau* and the *B.E. Lindholm*. The *Mermentau* worked from September 30, 1999 until November 28, 1999 dredging 1,105 loads. The *B.E. Lindholm* worked from November 29, 1999 until January 10, 2000, and dredged 650 loads of material. A total of 1,755 loads of dredged material were collected and deposited into Placement Area No. 1-A. Dredging was performed between Stations 50+00 along the Jetty Channel and -90+00 along the Entrance Channel. A total of 1,555,615 CY of material were excavated from this project.

The dredges were equipped with rigid draghead turtle deflectors, and 100% inflow screening with a 4-inch square mesh. NMFS-approved turtle observers provided 24-hour/day monitoring of dragheads and screens for each load cycle. The observers were employed by Coastwise Consulting under a subcontract to the dredging contractor, Weeks Marine, Inc

During the performance of this dredging, no lethal turtle takes were experienced. There were, however, several occasions when loggerhead and green sea turtles were observed swimming in the vicinity of the dredge. The water temperature during these sightings ranged from 24.0°C – 26.0°C.

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Water temperatures were taken in conjunction with the screen and draghead monitoring. The water seemed to be well mixed, as the surface and below mid-depth temperatures were identical. These temperatures ranged from 12.0°C to 27.0°C.

Throughout the duration of dredging, bridge watch observations included numerous sightings of bottlenose dolphins (*Tursiops truncatus*).

The material dredged consisted of primarily silt with significant amounts of clay. Non-biological samples commonly included wood, netting, rocks, monofilament fishing line, plastic bags, and cable, along with other debris. The most common biological samples were comprised of various species of fish, rays, crabs, shrimp, whelks, eels, and grass.

**Sabine - Neches Waterway – Sabine Pass Outer Bar and Sabine Bank Channels**

On January 11, 2000 the contract hopper dredge *B.E. Lindholm* began work on the Sabine Pass Outer Bar, and Sabine Bank Channels of the Sabine-Neches Waterway Project. Contract specifications required dredging an estimated 3,677,000 cubic yards (CY) of shoal material. The required depth of dredging was 44 feet below Mean Low Tide (MLT, Corps of Engineers Datum), with 2 feet of allowable overdepth dredging.

Dredging began on January 11, 2000, and was completed on May 2, 2000. Dredging operations were not continuous during this time period. The dredge left the site on January 26 to perform dredging elsewhere, and returned on March 7. A total of 2,154 loads of dredged material were collected and deposited into Placement Area Nos. 2 and 4. Dredging was performed between Stations 2+000 and 18+000 along the Outer Bar Channel, and from 50+000 to 80+000 along the Sabine Bank Channel. A total of 4,782,702 CY of material was excavated from this project.

The dredge was equipped with rigid draghead turtle deflectors, and 100% inflow screening with a 4-inch square mesh. NMFS-approved turtle observers provided 24-hour/day monitoring of dragheads and screens for each load cycle. The observers were employed by Coastwise Consulting, Inc. under a subcontract to the dredging contractor, Weeks Marine, Inc.

During the performance of this dredging, no lethal turtle takes were experienced.

Water temperatures were taken in conjunction with the screen and draghead monitoring. The water seemed to be well-mixed, as the surface and below mid-depth temperatures were nearly identical. These temperatures ranged from about 13°C - 15°C during January operations, and 20°C - 26°C during the remainder of the job.

Throughout the duration of dredging, bridge watch observations included numerous sightings of bottlenose dolphins.

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The material dredged consisted of primarily silt, with occasional accumulations of stiff clay. Non-biological samples commonly included rope, wood, netting, and rocks, along with other debris. The most common biological samples were comprised of various species of fish, rays, blue crabs, shrimp, whelks, eels, moon snails, oysters, other crab species, and jellyfish.

**Freeport Harbor - Entrance and Jetty Channels**

On July 30, 2000 the contract hopper dredge *Stuyvesant* began work on the Entrance and Jetty Channels of the Freeport Harbor Project. Contract specifications required dredging an estimated 757,000 cubic yards (CY) of shoal material. The required depth of dredging was 49 feet below Mean Low Tide (MLT, Corps of Engineers Datum), with 2 feet of allowable overdepth dredging along the Entrance Channel and 47 feet MLT with 2 feet of overdepth along the Jetty Channel.

Dredging began on July 30, 2000, and was completed on August 28, 2000. A total of 452 loads of dredged material were collected and deposited into Placement Area No. 1-A. Dredging was performed between Stations 59+62 and 95+67 along the Jetty Channel and from -110+00 to -200+00 along the Entrance Channel. A total of 1,859,847 CY of material were excavated from this project.

The dredge was equipped with rigid draghead turtle deflectors, and 100% inflow screening with a 4-inch square mesh. NMFS-approved turtle observers provided 24-hour/day monitoring of dragheads and screens for each load cycle. The observers were employed by Coastwise Consulting, Inc. under a subcontract to the dredging contractor, Bean-Stuyvesant L.L.C.

During the performance of this dredging, two loggerhead sea turtle takes were documented. The first take occurred on August 10, 2000 in load No. 207. This turtle was found alive, however, it died prior to transport to a rehabilitation facility. The second take occurred on August 15, 2000 in load No. 295. The water temperature during these takes was 29.0°C – 30.0°C.

Water temperatures were taken in conjunction with the screen and draghead monitoring. The water seemed to be well-mixed, as the surface and below mid-depth temperatures were nearly identical. These temperatures ranged from 27.0°C – 32.0°C.

Throughout the duration of dredging, bridge watch observations included numerous sightings of bottlenose dolphins. On August 19, a dead turtle was seen floating in the vicinity of the dredge, and was identified as a leatherback. The water temperature at the time of this sighting was 31.0°C.

The material dredged consisted of primarily silt with significant amounts of clay. Non-biological samples commonly included human-generated debris, particularly fishing gear. The most common biological samples were comprised of various species of fish, eels, skates, rays,

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crabs, shrimp, whelks, and sargassum. The screens were frequently clogged with sargassum and clay, which resulted in downtime while the screens were manually cleared. On several occasions, the clay became such a problem that the inflow screens had to be opened. During these periods, 100% overflow screening was conducted.

## COSTS

The costs incurred in performing the turtle-monitoring program during FY 2000 include the costs for equipping and maintaining screens and draghead deflectors on contractor-owned dredges, as well as providing NMFS-approved observers. In addition to the direct costs are District costs for administration and oversight. Below is a table depicting the costs for FY 2000. However, costs not included in this discussion are unquantifiable costs associated with decreased dredging efficiency which may result from the use of the draghead deflectors, and downtime experienced during cleaning of excessively fouled screens. Estimates of these increased costs are anticipated by the potential contractors during the preparation of bids, and there is no way to determine the actual value of these costs.

PROJECT	COST OF MONITORING
Freeport Harbor, Sep 30, '99 – Jan 10, '00	\$17,500.00
Sabine - Neches Waterway	42,000.00
Freeport Harbor, Jul 30, '00 – Aug 28, '00	17,000.00
District labor	5,355.00
TOTAL	\$81,855.00

## SUMMARY

During Fiscal Year 2000, three maintenance-dredging projects were performed by hopper dredges. Below is a table summarizing lethal turtle encounters.

# INCIDENTAL TAKES OF SEA TURTLES

## MAINTENANCE DREDGING

FY 2000

Date Taken	Project	Dredge	Channel Reach	Water Temp. (°C)	Species and Authorized Incidental Take per Fiscal Year			
					Kemp's ridley 7	Loggerhead 15	Green 5	Hawksbill 1
Aug. 10, 2000	FH	<i>Stuyvesant</i>	-110+00 to -160+00	29.0		1		
Aug. 15, 2000	FH	<i>Stuyvesant</i>	Vicinity of 0+00	30.0		1		
TOTAL TAKE					0	2	0	0
ALLOWABLE TAKE REMAINING					7	13	5	1